SAGRADO
Universidad del Sagrado Corazón

**SCHOOL OF HEALTH AND SCIENCES**

**SYLLABUS**

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| **TITLE:** | Exercise Physiology II |
| **CODE:** | CFI 204 |
| **PREREQUISITE:** | CFI 203 |
| **CREDITS:** | 3 credits \| 45 contact hours \| 1 term |

## DESCRIPTION

This theoretical course discusses acute and chronic adaptive responses that occur during different stages of life. The endocrine system and its adaptations with exercise, activity and physical training are studied. The student learns the different adaptive responses that occur immediately and long-term in hormone control. Also, physiological responses during exercise, physical activity, and training at altitude are learned.

## JUSTIFICATION

After completion of this course, the exercise science student gains knowledge of the complications that occur through the evolution of life in physiological terms. This allows the student to develop a training plan adjusted to the characteristics of each stage of maturation, i.e., children, adolescents, youth, adults, and the elderly. Another of the most important reasons in terms of knowledge is the relationship between hormonal control and its relationship with performance and certain health conditions that can represent limitations to physical performance and health. Anyone whose profession is related to and aimed at the development and maintenance of physical performance should be aware of the various adaptations of different stimuli by exercise, physical activity, and training in the endocrine system.

## COMPETENCES

The course develops the following competences in students:

- **Critical questioning**
- **Research and exploration**

## OBJECTIVES

After completion of the course, students will be able to:

1. Identify and analyze the structure and function of the endocrine system.
2. Know the effects of the consumption of ergogenic aids on the physiological response during training.
3. Identify and analyze each of the energy and metabolic systems related to acute and chronic physical exertion.
4. Know and identify the differences in physiological responses between men and women.
5. Know the physiological adaptations caused by physical training, particularly in the population of children, young people, adults, and the elderly.
6. Know the physiological responses related to training in environmental conditions of altitude.
7. Know the response to training of the overweight and obese individual, as well as the implications of these conditions to physical exertion

## CONTENTS

I. Hormone Control During Exercise
   A. The endocrine system
   B. Hormones, their functions, and adaptations
   C. Endocrine glands and their hormones
   D. Hormonal regulation of metabolism during exercise
   E. Hormonal regulation of fluids and electrolytes during exercise

II. Adaptations to Resistance Training
   A. Resistance training and muscle fiber gains
   B. Mechanisms of muscle strength gains
   C. Muscle pain and cramps
   D. Resistance training for special populations

III. Exercise at Altitude
   A. Environmental conditions at altitude
   B. Physiological responses to acute exposure to altitude
   C. Exercise and sports performance at altitude
   D. Acclimatization: chronic exposure to altitude
   E. Altitude: optimizing training and performance
   F. Health risks of acute exposure to altitude

IV. Body Composition and Sport Nutrition

A. Body composition in sport
B. Nutrition and sport patterns

V. Ergogenic aids and sport
A. Research on ergogenic aids
B. Pharmacological agents
C. Hormonal agents
D. Physiological agents
E. Nutritional agents

VI. Children and adolescents in sport and exercise
A. Growth, development, and maturation
B. Physiological responses to acute exercise
C. Physiological adaptations to exercise training
D. Motor and athletic performance capability
E. Referential statistical data

VII. Ageing in Sport and Exercise
A. Weight, height, and body composition
B. Physiological responses to acute exercise during aging
C. Physiological adaptations to exercise training
D. Referential statistical data

VIII. Gender Differences in Sport and Exercise
A. Body size and composition
B. Physiological responses to acute exercise
C. Physiological adaptations to exercise training
D. Athletic performance

IX. Obesity, Diabetes and Physical Activity
A. Physiological response implications in obese and overweight individuals
B. Performance implications of diabetes

**METHODOLOGY**

The following strategies from the active learning methodology are recommended:

- Lectures
- Discussion (debates as a learning strategy)
- Lab and field test-based learning
- Collaborative learning

## EVALUATION

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| Partial assignments | 30% |
| Oral presentation | 20% |
| Final project or exam | 15% |
| Immersion experience | 15% |
| Compositions | 20% |
| **Total** | **100%** |

## LEARNING ASSESSMENT

The institutional assessment rubric is applied to the course's core activity.

## BIBLIOGRAPHY

TEXTBOOK

Kenney, W. L., Wilmore, J., & Costill, D. L. (Eds.). (2020). *Physiology of Sport and Exercise*. (7th ed.). Human Kinetics, Inc.

REFERENCES

Bishop, P.A. (2018). *Measurement and Evaluation in Physical Activity Applications: Exercise Science, Physical Education, Coaching, Athletic Training and Health*. (2*nd* ed.). Routledge

Ehrman, J.K., Gordon, P.M., Visich, P.S., & Keteyian, S.J. (2013). *Clinical Exercise Physiology*. (3rd ed.). Human Kinetics, Inc.

Haff, G.G., Dumke, C. (2019). *Laboratory Manual for Exercise Physiology*. (2nd ed.). Human Kinetics, Inc.

Kramer, W.J., Fleck, S.J., & Deschenes, M.R. (2016). *Exercise Physiology. Integrations Theory and Application*. (2nd ed.). Lippincott William & Wilkins

Marieb, E.N. (2015). *Essentials of Human Anatomy and Physiology*. (11th ed.). Pearson.

McArdle, W.D., Katch, F.I., & Katch, V.I. (2014). *Exercise Physiology*. (7th ed.). Wolters

Klower

Milner, C.E. (2019). *Functional Anatomy for Sport and Exercise*. (2nd Ed.). Routledge.

Murray, R., Kenney, W.L. (2015). *Practical Guide to Exercise Physiology*. (1st ed.). Human Kinetics, Inc.

Plowman, S.A., Smith, D.L. (2017). *Exercise Physiology for Health Fitness and Performance*. (5th ed.). Wolters Kluwer.

Powers, S., Howley, E. (2017). *Exercise Physiology: Theory and Application to Fitness and Performance*. McGraw Hill.

Radak, Z. (2018). *The Physiology of Physical Training*. (1st ed.). Academic Press.

For more information resources related to the course's topics, access the library's webpage http://biblioteca.sagrado.edu/

## REASONABLE ACCOMMODATION

For detailed information on the process and required documentation you should visit the corresponding office. To ensure equal conditions, in compliance with the ADA Act (1990) and the Rehabilitation Act (1973), as amended, any student in need of reasonable accommodation or special assistance must complete the process established by the Vice Presidency for Academic Affairs.

## ACADEMIC INTEGRITY

This policy applies to all students enrolled at Universidad del Sagrado Corazón to take courses with or without academic credit. A lack of academic integrity is any act or omission that does not demonstrate the honesty, transparency, and responsibility that should characterize all academic activity. Any student who fails to comply with the Honesty, Fraud, and Plagiarism Policy is exposed to the following sanctions: receive a grade of zero in the evaluation and / or repetition of the assignment in the seminar, a grade of F (*) in the seminar, suspension, or expulsion as established in the Academic Integrity Policy effective in November 2022.